

Method and Apparatus for Reducing Errors due to Line Asymmetry in Devices
Utilizing Coherent Population Trapping

ABSTRACT

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An apparatus and method for measuring CPT is disclosed. The apparatus includes a quantum absorber that is irradiated by radiation from an electromagnetic radiation source. The quantum absorber includes a material that exhibits CPT. The electromagnetic radiation source generates electromagnetic radiation having first and second CPT-generating frequency components. The first CPT-generating frequency component has a frequency $v_L - v$, and a first CPT component amplitude. The second CPT generating frequency component has a frequency $v_L + v$ and a second CPT component amplitude. The apparatus also includes a detector for generating a detector signal related to the power of electromagnetic radiation that leaves the quantum absorber. The detector signal exhibits an asymmetry as a function of frequency v in a frequency range about a frequency v_0 . The apparatus includes an asymmetry servo loop that alters one of v_L , the first CPT component amplitude, and the second CPT component amplitude to reduce the asymmetry.